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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/973,392 | 10/09/2001 | Yulan Liu | ferro09201 | 6073 |

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| EXAMINER | |
|---|---|
| PHAM, LEDA T | |
| **ART UNIT** | **PAPER NUMBER** |
| 2834 | |

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/973,392 | LIU ET AL. | |
| | Examiner | Art Unit | |
| | Leda T. Pham | 2834 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) *27-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10/9/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of group I, claims 1 - 26 in Paper filed on 9/8/03 is acknowledged.

**2.** Since Applicant did not provide any traversal arguments to the restriction requirement, the response is considered as election without traverse; therefore, the election/restriction is made FINAL.

### *Claim Rejections - 35 USC § 102*

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4 - 5, 7, 12 – 14, 17 - 18, 20, and 25 - 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Gowda et al. (U.S. Patent No. 4,694,213).

Referring to claim 1, Gowda teaches a ferrofluid pivot bearing (figure 3) comprising a shaft (2), a first magnetic element (18) fixedly attached to said shaft forming a shaft assembly, a housing (4) containing said first magnetic element fixedly attached to said shaft wherein said housing is rotatable about said first magnetic element, and a quantity of magnetic fluid (38) between said housing and said first magnetic element.

Referring to claim 4 and 17, Gowda teaches the pivot bearing further comprising a magnetic coating (the magnet 10) over at least a portion of an outside surface (any surface that is not directly face to the shaft is outside surface) of said housing (4).

Referring to claim 5 and 18, Gowda teaches the pivot bearing wherein the magnetic coating (the magnet 10) covers substantially all of the major surface of said outside surface (the surface facing to the stator is the major surface) of said housing (4).

Referring to claim 7 and 20, Gowda teaches the pivot bearing further comprising at least a second magnetic element (20) fixedly attached to said shaft (figure 3).

Referring to claim 12 and 25, Gowda teaches the pivot bearing further comprising a ferrofluid-repellent coating (38) on a portion of said shaft corresponding to the ends of said housing (figure 3).

Referring to claim 13 and 26, Gowda teaches the pivot bearing further comprising a ferrofluid-repellent coating (38) on a portion of said housing located at the ends of said housing adjacent to said shaft (figure 3).

Referring to claim 14, Gowda teaches a ferrofluid pivot bearing (figure 3) comprising a shaft (2), a first magnetic element (18) concentrically and fixedly attached to said shaft, a housing (4) having a first end (32) and a second end (40), said first end and said second end having a central opening sized to receive said shaft, said housing containing said first magnetic element fixedly attached to said shaft wherein said housing is rotatable about said first magnetic element; and a quantity of magnetic fluid (38) within said housing.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2, 8 – 11, 15, 21 - 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda in view of Ries (U.S. Patent No. 5,710,469).

Referring to claim 2 and 15, Gowda teaches the claimed invention, except for the added limitation of the shaft is non-magnetic.

Ries teaches a magnetic bearing having a non-magnetic shaft (4) for improving an axial and radial contact-free and non-wearing, low friction bearing.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a non-magnetic shaft in the ferrofluid pivot bearing as taught by Ries. Doing so would provide an axial and radial contact-free and non-wearing, low friction bearing.

Referring to claim 8 and 21, Ries teaches the pivot bearing further comprising an inner bearing element (8a) fixedly attached to said shaft between said first magnetic element (6a) and said at least a second magnetic element (6b, figure 1)

Referring to claim 9 and 22, Ries teaches the pivot bearing wherein said inner bearing element is made of a magnetic material (lines 6 – 10, column 4)

Referring to claim 10 and 23, Ries teaches the pivot bearing comprising an outer bearing element (8g) adjacent said first magnetic element (6a) and an end of said housing (10)

Referring to claim 11 and 24, Ries teaches the pivot bearing wherein said outer bearing element is made of a magnetic material (lines 6 – 10, column 4).

6. Claims 3, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda as applied to claim 1, 14 above, and further in view of Tokushima et al. (U.S. Patent No. 5,645,355).

Referring to claim 3 and 16, Gowda teaches the claimed invention, except for the added limitation of the housing is non-magnetic.

Tokushima teaches a bearing unit having a non-magnetic housing (1) for containing a magnet and a magnetic fluid.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a non-magnetic housing in the ferrofluid pivot bearing as taught by Tokushima. Doing so would provide a bearing conformed to the high-speed and high accuracy rotating operations.

7. Claims 6, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda as applied to claim 1, 14 above, and further in view of Goto et al. (U.S. Patent No. 5,700,563).

Referring to claim 6 and 19, Gowda teaches the claimed invention, except for the added limitation of the magnetic coating containing one or more of nickel, iron, and nickel iron alloy.

Goto teaches in his invention the magnetic coating containing one or more of nickel, iron, and nickel iron alloy for efficient the magnetic characteristic.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select nickel, iron, and nickel iron alloy for magnet coating as taught by Goto. Doing so would efficient the magnetic characteristic. Also, it has been held to be within the general skill of a worker in the art to select a known material in the basis of its suitability for the intended use as a matter of obvious design choice. ***In re Leshin 125 USPQ 416.***

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leda T. Pham whose telephone number is (703) 305-4864. The examiner can normally be reached on M-F (7:30-5:00) first Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

Leda T. Pham
Examiner
Art Unit 2834

LTP
November 20, 2003

BURTON S. MULLINS
PRIMARY EXAMINER